

CLAIMS

1. A multi-carrier communication apparatus for simultaneously transmitting a plurality of different data streams from a plurality of antennas using the same carrier group,
5 said apparatus comprising:

a determination section that determines whether a peak power is occurred in at least one data stream, and

an exchange section that exchanges a part of data in said data stream for a part of data in another data stream when it
10 is determined that the peak power is occurred.

2. The multi-carrier communication apparatus according to claim 1, wherein said determination section comprises:

a measurement section that measures a power of each data stream, and

15 a comparison section that compares a measured power with a predetermined threshold, and
wherein said determination section determines a peak power is occurred in a data stream of which the measured power is greater than a predetermined threshold as a result of comparison.

20 3. The multi-carrier communication apparatus according to claim 1, wherein said exchange section comprises:

an exchange pattern decision section that decides a pattern for exchanging a part of data in each data stream in units of predetermined groups of carriers, and

25 a data exchange section that exchanges a part of data in each data stream according to the decided exchange pattern.

4. The multi-carrier communication apparatus according to

claim 3, wherein said exchange pattern decision section decides a pattern for exchanging data between groups having an equal frequency among carrier groups.

5 5. The multi-carrier communication apparatus according to claim 3, wherein said exchange pattern decision section decides a pattern for exchanging data between groups having different frequencies among carrier groups.

6. The multi-carrier communication apparatus according to claim 3, wherein said data exchange section exchanges orthogonal
10 pilot data included in a part of data in each data stream.

7. The multi-carrier communication apparatus according to claim 3, wherein said data exchange section does not exchange orthogonal pilot data included in a part of data in each data stream.

15 8. The multi-carrier communication apparatus according to claim 1, wherein said exchange section comprises a transmission section that transmits exchange pattern information for communicating a pattern for exchanging data to a communication opposite station.

20 9. The multi-carrier communication apparatus according to claim 8, wherein said transmission section transmits exchange pattern information using a particular carrier excluded from an object to be exchanged.

10. The multi-carrier communication apparatus according to
25 claim 1, further comprising a formation section that forms different directivity weights for each data stream,
wherein when data are exchanged by said exchange section, said

formation section performs an exchange of the directivity weights in response to an exchange of the data.

11. The multi-carrier communication apparatus according to claim 1, further comprising a production section that subjects
5 transmit data to coding so as to produce a plurality of different data streams having a coding relation with each other.

12. The multi-carrier communication apparatus according to claim 11, wherein said production section subjects transmit data to block coding at every predetermined block coding unit, and
10 wherein said exchange section performs an exchange of data using said block coding unit as a minimum unit.

13. The multi-carrier communication apparatus according to claim 11, wherein said production section subjects transmit data to convolution coding so as to produce a plurality of different
15 data streams.

14. The multi-carrier communication apparatus according to claim 11, wherein said production section subjects transmit data to turbo-coding so as to produce a plurality of different data streams.

20 15. A communication terminal apparatus having the multi-carrier communication apparatus according to claim 1.

16. A base station apparatus having the multi-carrier communication apparatus according to claim 1.

17. A multi-carrier communication method for simultaneously
25 transmitting a plurality of different data streams from a plurality of antennas using the same carrier group, said method comprising the steps of:

determining whether a peak power is occurred in at least one data stream, and

exchanging a part of data in said data stream for a part of data in another data stream when it is determined that the
5 peak power is occurred.